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Understanding gaming behavior: Academic and emotional competence as predictors of gaming disorder in gifted youth

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Article Information	Abstract
DOI: 10.14527/edure.2025.01	The internet and computers are an important part of the education of gifted children. However, it is emphasized that excessive use for gaming purposes can affect the academic competence of
Article History:Received05 January 2025Revised25 January 2025Accepted02 February 205Online01 April 2025	children. This research aimed to identify the impact of online gaming on the development of academic, social, and emotional competences in gifted children. This research consisted of 252 gifted children who studied in special centers for training children with gifted children. The regression analysis was conducted and as a result, it was found that academic competence and emotional competence accounted for 30.30% of online gaming disorder in gifted children; however, social competence was not identified as a significant predictor of online gaming disorder
Keywords: Gaming disorder, Gifted children, Self-efficacy.	in these children. Additionally, it was also discovered that levels of gaming disorder and academic competence varied by gender whereas social and emotional competences did not. Similarly, it was also demonstrated that the number of siblings and/or the educational background of parents did not have a significant impact on online gaming disorder as well as academic, social, and emotional competence levels in highly gifted children. It is considered important to conduct counseling
Article Type: Research paper	interventions in schools to improve the self-efficacy of gifted children.



Introduction

Video games began to enter households in the early 1970s with the development of the Odyssey by Ralph Baer (McCall, 2022), and within a brief span of ten years, evolved into a global industry (Fish, 2021). This growth has continued into the present day. Notably, the widespread adoption of smartphones and life events such as the COVID-19 restrictions have led to significant increases in the number of gamers (King et al., 2020; López-Cabarcos et al., 2020). In Western countries, gaming has become a mainstream activity among adolescents and young adults (Engelstätter & Ward, 2022). Furthermore, video games have become integral to various sectors, including education and healthcare (Winaldo & Oktaviani, 2022), while live-streamed gaming platforms and esports competitions have started to generate substantial revenues (Rykala, 2020). Although video games were primarily associated with children and adolescents since the 1980s, the number of adults who play video games regularly has now surpassed the number of adults who do not (The Entertainment Software Association, 2024).

As it can be understood, the development of new technologies and easy access to the Internet have brought several positive contributions to facilitating daily life, but have also led to negative effects such as online gaming disorder (Lee et al., 2019). Therefore, these negative effects attract the attention of researchers, it also attracts the attention of parents since most of the affected population consists of children whereas it attracts the attention of government since it also affects the society (Clark & Scott, 2009; Holden, 2010; Kuss & Griffiths, 2012).

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Video game addiction or gaming disorder that has been an ongoing discussion since the 1980s (King et al., 2013; Wichstrøm et al., 2019), was assessed under the Internet addiction context along with social media, cyber-sex and online gambling addiction for a while; however, the insufficiency of experimental evidence to explain this context and the reason that addictions within this context are frequently accompanied by psychiatric disorders beclouded explaining its etiology (Billieux et al., 2015; Montag & Reuter, 2015). Thus, the American Psychiatric Association also called attention to the insufficient studies on the etiology in DSM-V diagnosis code handbook and emphasized that there is a need for evidence related to "online gaming disorder (American Psychiatric Association, 2013) even though there are different epidemiologic studies conducted in different cultures (Arıcak et al., 2019). Also, they emphasized in DSM-V that online gaming disorder caused results similar to substance use addiction (Arıcak et al., 2019), and the brain screening studies displayed results that support this situation (Kuss & Griffiths, 2012).

However, the World Health Organization included the diagnosis of online and offline gaming disorder in their handbook, the ICD-11, which was presented to the World Health Assembly in May 2019 and officially published on January 1st, 2022. In these diagnostic codes, losing control in such matters as duration spent gaming and ending the process of gaming, the negative effects of the duration of gaming on daily life activities, and continuing online gaming despite the negative effects of gaming are included (WHO, 2018). As in the DSM-V, the ICD-11 also emphasizes "gaming behavior and impaired control over gaming behavior affecting social, occupational, and personal life for at least 12 months," but it does not include withdrawal symptoms in the ICD-11 (Starzec et al., 2024).

As defined as a form of addiction by the ICD-11, and despite the global prevalence of gaming disorder being approximately 3%, the anticipated increase in its prevalence, and its significant consequences (Anthony et al., 2023; Stevens et al., 2021), it is important to highlight that progress in research on treatments such as therapy, medication, or other interventions has been slow. There is a critical need for stronger evidence and more effective applications in the fields of treatment and rehabilitation (Danielsen et al., 2024; Efrati, 2023; Sharma & Weinstein, 2024).

This situation may be linked to the chaotic nature of the disorder's causality, which stems from the interaction of various risk and protective factors. In fact, research has identified a wide range of risk factors, including adverse childhood experiences, histories of neglect or abuse (Efrati, 2023), negative interactions with parents, parental neglect (She et al., 2022), attachment issues with parents (Warburton et al., 2022), difficulties in emotional regulation, attention problems (Bender, 2020), hyperactivity symptoms (Eltahir et al., 2024), impulsivity (Zhu et al., 2023), low self-control, high levels of depression, social exclusion (Macur & Pontes, 2021), difficulties in executive functions (Ropovik et al., 2023), high anxiety (Rho et al., 2018), negative peer relationships (Teng et al., 2020), low academic or cognitive performance, and school adjustment issues (Bender et al., 2020). This situation may be linked to the chaotic nature of the disorder's causality, which stems from the interaction of various risk and protective factors. In fact, research has identified a wide range of risk factors, including adverse childhood experiences, histories of neglect or abuse (Efrati, 2023), negative interactions with parents, parental neglect (She et al., 2022), attachment issues with parents (Warburton et al., 2022), difficulties in emotional regulation, attention problems (Bender, 2020), hyperactivity symptoms (Eltahir et al., 2024), impulsivity (Zhu et al., 2023), low self-control, high levels of depression, social exclusion (Macur & Pontes, 2021), difficulties in executive functions (Ropovik et al., 2023), high anxiety (Rho et al., 2018), negative peer relationships (Teng et al., 2020), low academic or cognitive performance, and school adjustment issues (Bender et al., 2020).

As it can be seen in the conducted research, online gaming disorder and technological improvements generally cause disadvantages that concern the general population, and the gifted children (Siegle, 2017). Without a doubt, it is pleasing that the internet use and the latest technological improvements have become widespread allowing gifted children to be included in online STEM education and to access information in a quicker way (Stoeger et al., 2017), and allowing online teacher training (Edinger, 2017) and online education programs for the parents of gifted children (Leana-Taşçılar et al., 2016). However, it is a fact that when the duration of online or offline games played by the gifted children increases, the tendency to be more careless in behavior increases (Alloway et al., 2016), excessive use of technology generally affects divergent thinking skills negatively in gifted children (Freeman, 2016), gifted children give relatively more importance to technology, the internet and playing online games compared to their peers who display normal developments, and the majority of the children in this group feel sad and angry when they are offline (Özcan & Biçen, 2016).

Gifted children are widely recognized as a valuable resource capable of making significant contributions to society (Emir, 2017; Robinson, 2008). As a result, research on gifted children has predominantly focused on their educational needs, both within Turkey and globally (Ayvacı & Bebek, 2019; Worrell et al., 2019). However, relatively little academic

attention has been given to the other needs of gifted children, particularly their behavioral addictions. This is despite a significant body of research showing that many gifted children experience social and emotional challenges (Callard-Szulgit, 2003; David, 2017; Eren et al., 2018; Zeidner & Matthews, 2017). Furthermore, academic, social, and emotional competencies have been shown to influence academic performance in both the short and long term (Yokoyama, 2019).

Certainly, the consequences of social and emotional needs are not only observed in the academic domain. Furthermore, individuals who face difficulties in emotion regulation and self-efficacy may resort to behavioral addictions as a coping mechanism, with gaming being one of the most prominent examples (Estupina et al., 2024; Kristensen et al., 2024; Sharma, 2022). Online games can function as a means of creating self-worth by providing a sense of achievement and autonomy, and individuals may use gaming as a way to escape from negative emotional states resulting from negative core beliefs about the real world. In cases where gaming addiction is alleviated, a low level of self-efficacy serves as a risk factor for the relapse of gaming disorder or the onset of another behavioral addiction. Considering that the primary goal of special education for gifted children is to help them reach their full potential and, indirectly, benefit society, this context presents itself as a risk factor. From this perspective, the present study seeks to examine the impact of online gaming on the academic, social, and emotional competencies of gifted children.

In this sense, it is thought that the current study will draw attention to the importance of online and offline gaming disorder variable in the studies related to the emotional and social developments of the gifted students for the experts studying in psychological counseling and guidance, the gifted, special education, and the individual program development field. The results obtained from the current study will contribute to the instructions about online and offline gaming levels and the duration to be spent in these platforms in the individual education programs that are prepared for the academic, emotional, and social needs of the gifted children.

Method

Participants

This study is conducted with 252 children who are diagnosed as gifted, aged between 10 and 14, studying in a center for the gifted children (BILSEM) in İzmir, Turkey; and the required permissions were obtained from either the students themselves or one of their parents. The sample of the study is selected through convenience sampling method due to the advantage it provides in terms of time and sources (Büyüköztürk, 2009). Hakem 1: While convenience sampling is beneficial for practical reasons, it is important to note that this method may limit the generalizability of the findings. In this study, only children diagnosed as gifted were accessed. The majority of diagnosed gifted children come from families in middle and upper socio-economic groups, while gifted children from lower socio-economic groups face diagnostic issues (Reynen-Woodward et al., 2023) The descriptive findings related to the children in the sample group are presented in Table 1.

Data Collection Materials

In this study, the following tools were used to measure the participants' academic, social, emotional, and general self-efficacy levels: the Self-Efficacy Scale for Children; to determine the level of online gaming disorder, the Internet Gaming Disorder Scale – Short Form; and to assess the participants' socio-demographic characteristics, a Personal Information Form developed by the researchers.

Internet Gaming Disorder Scale – Short Form: The original version of the scale was developed by Pontes and Griffiths (2015), taking into account the diagnostic criteria in DSM-V. During the development process, data were collected from 1,060 participants aged 16-70 from 58 different countries. The measurement tool focuses on the participants' behavior over the past 12 months, and responses are scored as 1 - Never, 2 - Rarely, 3 - Sometimes, 4 - Often, and 5 - Very Often. There are no reverse-scored items in the scale, and it is a one-dimensional scale, evaluated based on the total score. The score range is from 9 to 45, with a cut-off point of 36 indicating gaming disorder. The item loadings of the scale range from .54 to .77, and its Cronbach's alpha value is .87. The Turkish validity and reliability studies of the scale were conducted by Arıcak, Dinç, Yay, and Griffiths (2019) with a sample of 465 participants aged 10-29, and test-retest reliability was performed with 64 participants. The item loadings ranged from .39 to .71, the Cronbach's alpha value was found to be .82, and the test-retest reliability coefficient was .78. It was concluded that the scale retained its unidimensional and 9-item structure.

Table 1

Descriptive Findings of the Participants.

	Gifted Children	1
-	n	%
Gender		
Female	101	40.10
Male	151	59.90
Number of siblings		
No Siblings	74	29.40
Two Siblings	145	57.50
Three or more siblings	33	13.10
Education level of mother		
Primary and Secondary	14	5.50
High school	46	18.30
Bachelor's degree	159	63.10
Master's degree	33	13.10
Education level of father		
Primary and Secondary	8	3.10
High school	39	15.50
Bachelor's degree	162	64.30
Master's degree	43	17.10

Self-Efficacy Scale for Children: The original version of the scale was developed by Muris (2001) with 330 participants aged 14-17. It is a Likert-type scale, scored between 1 - Not at all and 5 - Very good. The original form consists of 21 items, with 7 items measuring social self-efficacy, 7 items measuring academic self-efficacy, and 7 items measuring emotional self-efficacy. Additionally, the total score obtained from the scale indicates the general self-efficacy level. The Cronbach's alpha coefficient for the original version was .88 for general self-efficacy, .88 for academic self-efficacy, and .88 for emotional self-efficacy. The Turkish validity and reliability studies were conducted by Telef and Karaca (2012) with 933 students in elementary and high school. It was reported that the scale preserved its original 21-item and 3 sub-dimensional structure, with the total score range being between 21 and 105, item loadings ranging from .305 to .612, and the general Cronbach's alpha value being .86. The Cronbach's alpha for the subdimensions was .84 for academic self-efficacy, .64 for social self-efficacy, and .78 for emotional self-efficacy.

Personal Information Form: The Personal Information Form was developed by the researchers to determine the participants' socio-demographic characteristics. It aims to collect information about variables such as gender, grade level, parents' educational level, and number of siblings.

Data Analysis

After selecting the measurement tools, permission for use was obtained from the authors who conducted the validity and reliability studies of the scales via email. Subsequently, the necessary applications were made to the relevant units of the Ministry of National Education, and approval was obtained. After receiving permission, participants were contacted and invited to complete the forms after consent was obtained from both the participants and their parents.

The socio-demographic variables were determined through descriptive statistics from the data obtained via the aforementioned measurement tools. Hakem 1: Additionally, several statistical tests were conducted. Levene's test was used to assess the homogeneity of variances, Shapiro-Wilk test was applied to check the normality of the data, Durbin-Watson test was performed to evaluate autocorrelation in the residuals. The skewness, kurtosis, tolerance, and VIF (Variance Inflation Factor) values were also analyzed to assess the assumptions of normality and multicollinearity. The results indicated that there were no issues with multicollinearity, and the data distribution was normal.

Results

The first finding of the study is 4.37% (n=11) of the gifted children who participated in the study scored 36 and more, which is the cut points of the Short Form for Internet Gaming Disorder Scale. 5.96% (n=9) of the male participants and 1.98% (n=2) of the female participants scored 36 and more. The means, standard deviations, and Pearson product-moment correlation coefficients for the Internet gaming disorder scale and the subscales of self-efficacy scale for children of the gifted children are presented in Table 2.

Table 2:

Correlation Coefficients of Dependent and Independent Variables.

	Mean	Sd	1	2	3
Online gaming disorder	19.78	7.82			
Academic self-efficacy	28.47	5.69	0.54		
Social self-efficacy	27.65	5.29	0.36	0.55	
Emotional self-efficacy	23.84	6.06	0.39	0.54	0.59

As it can be seen from Table 2, there is a medium level of correlation between online gaming levels and academic self-efficacy of the children whereas there is a weak and negative correlation between their social self-efficacy and emotional self-efficacy. Moreover, there is a medium and positive correlation between the subscales of self-efficacy scale for children. In Table 3, the results of the regression analysis which was conducted to determine the predictors of online gaming are presented.

Table 3.

R and R2 Changes Related to the Independent Variables' Prediction of Dependent Variable.

Model	Multiple r	r ²	r ² Change	F	β	р
n=252						
1	538 ^a	0.289	0.287	101.839	-0.463	0.000
2	551 ^b	0.303	0.298	54.203	-0.139	0.027

a) Predictor: Academic self-efficacy b) Academic self-efficacy, emotional self-efficacy

As can be seen in Table 3, Academic self-efficacy, which is a subscale of self-efficacy scale for children does alone explain 28.9% of the online gaming disorder levels of the gifted children. However, in the second model, it is seen that Academic self-efficacy and emotional self-efficacy explain 30.3% of the online gaming disorder levels of the gifted children. However, social self-efficacy that is a subscale of self-efficacy scale for children does not predict the online gaming disorder levels of the gifted children significantly. When the gifted children are compared in terms of their socio-demographic features, it is determined that the number of siblings of the gifted children does not differ in terms of their online gaming levels (F=1.565, p=.212), academic self-efficacy levels (F=2.342, p=.099), emotional self-efficacy levels (F=.964, p=.384) and social self-efficacy levels (F=1.814, p=.166). Similarly, it is found out that the education level of mothers does not differ in terms of their online gaming levels (F=.926, p=.348), academic self-efficacy levels (F=.411, p=.663), social self-efficacy levels (F=1.047, p=.353), and emotional self-efficacy levels (F=.049, p=.952). Moreover, it is also concluded that the education level of father variable does not differ in terms of their online gaming levels (F=.341, p=.712), academic self-efficacy levels (F=.024, p=.976), social self-efficacy levels (F= .667, p=.515), and emotional self-efficacy levels (F=.466, p=.628). Nevertheless, the findings show that the online gaming disorder levels of the gifted children = 19.74 (ss=7.11) differ significantly in favor of male students (t=-4.084; p=.000) when compared to the female students = 15.66 (ss=5.22); academic self-efficacy levels of the gifted children = 30.37 (ss=4.63) differ significantly in favor of female students (t=2.147; p=.034) when compared to the male students = 28.78 (ss=4.83); however, social self-efficacy levels (t=.196 ; p=.845) and emotional self-efficacy levels (t=.788 ; p=.432) do not differ significantly in terms of gender variable.

S6; Narration along with animation in N-RE-S6 and the name of the engine part described were given as keywords. The focus was on video and keywords. Attention was distracted in RE-S6 because it should focus on both animation, image, and text. Written text and keywords given in addition to narration caused extra fixation duration and CL (See Figures 14 and 15).

Discussion

The first finding of the study is that most participants scoring 36 and more that is the cut points of Short Form for Internet Gaming Disorder Scale is male participants, and the level of online gaming disorder of males is higher than female participants. In the studies conducted in different cultures, it is reported that male participants show more gaming behavior and problematic behavior caused by gaming than female participants (Arıcak et.al., 2019; Rehbein et.al., 2015; Wang et.al., 2019; Wichstrøm et.al., 2019; Yu & Cho, 2016). The study of brain screening before and after gaming conducted by Dong et al. (2018) also supports this finding. It is reported in the study that there is excessive movement in the frontal cortex of the male participants, and males desired for gaming more than females; the neurological stimulation differences between male and female is also emphasized. However, Lopez-Fernandez et al. (2019) evaluated the differences between males and females in terms of gender roles variable. They reported that the females are pushed into the background since the video game sector bases their game development process on male taste and acceptance, the characters in the games are dominantly male, and excessive aggression is associated with male behavior due to the gender roles, and this situation decreases the females playing these games. The neurologic-based future research considering the effect of gender roles can explain the etiology of gaming addiction.

Another finding obtained from the current study is that the online gaming disorder of the gifted children does not differ in terms of the education levels of their mothers & fathers and the number of their siblings. According to the statistics shared by the Turkish Statistical Institute (2024) with the title "Research on Information Technologies Use of Household," while the internet access of the households was 7% in 2004, it had an increasing course in each year and reached 88.8% in 2024. The diffusion of the internet and mobile devices and they're becoming a part of daily life have removed the effect of the variables such as education level, economic status, or the number of siblings and have made access to these devices easy for every child. It can be evaluated as an indicator of the prevalence of gaming disorder that more than one smartphone, tablet and computer exist in a household at the same time and the number of children owning a smartphone is rapidly growing.

It is remarkable that the number of intervention programs related to online gaming disorder is insufficient (Torres-Rodríguez et al., 2019). However, no intervention programs related to this subject exist in Turkey. Future research should develop intervention programs related to gifted children since it is determined that when the academic and emotional self-efficacy of the gifted children decreases, their levels of gaming disorder increase in the regression analysis conducted in the current study. It is seen that this finding agrees with the literature. When the studies are reviewed, it has been reported that the individuals who developed behavioral addiction or addiction to a certain substance use this substance or exhibit this behavior to regulate feelings or feel better (Griffiths, 1993; Griffiths, 2005), and that the adolescents with higher grades have lower behavioral addictions (Young, 1996; Young, 1998). Therefore, it is thought that it will be influential for future research to conduct psycho-educational studies related to increasing the academic and emotional self-efficacies of these children. Giving weight to the education of gifted children contribute to social benefit (Ayvacı & Bebek, 2019; Bolat & Tekin, 2017; Emir, 2017; Worrell et al., 2019). Future research should scrutinize the reasons why the children with a high level of online gaming disorder tend to exhibit this behavior and why they play the game, as well as they should determine which gap the game fills in; finally, the children should be supported by taking up another activity instead of gaming behavior (Adanır et al., 2016). Increasing social activities in schools and conducting psychological counseling studies on improving children's emotion regulation skills can be effective.

The last finding of the study that is thought to be interesting is that the gaming disorder levels of the gifted children do not play a predictor role on their social self-efficacy. Although there are studies in the literature proving that there is a correlation between social self-efficacy and addictions to the internet, game, and technology (İskender & Akın, 2010; Koo & Kwon, 2014), Jeong and Kim (2011) reported that only playing offline games adversely affects the social efficacy whereas playing online games does not adversely affect social self-efficacy. It is thought that the social self-efficacy of the children in the sample group of the current study was affected because they build relationships with each other through online games, they evaluate the games that they play as "e-sport," and the gamers communicate with each other verbally and in writing.

As a result, technological improvements are gaining speed worldwide, and the use of technology is rapidly becoming widespread. This situation makes it complicated for the parents to bring the access of the children to online devices under control. The effect of the increase in the number of game consoles, smartphones and computers and the increase in the number of gamers due to these devices introduced a sports organization named "e-sport," and, interestingly, playing video games is evaluated as a sports branch, and this organization reached a scale of 118 billion

dollars in 2019 (The Association for UK Interactive Entertainment, 2019). In addition, the number of adults who play video games regularly has now surpassed the number of adults who do not (The Entertainment Software Association, 2024). However, Gaming Disorder included in ICD-11 by World Health Organization (2018) has a great contradiction within itself. To remove this contradiction, there is a need for more studies on different study groups related to the etiology and results of online gaming disorder. It is also emphasized that progress in research on treatments involving therapy, medication, or other methods has been slow, and there is a growing need for robust evidence or practical applications regarding treatment and rehabilitation (Danielsen et al., 2024; Efrati, 2023; Sharma & Weinstein, 2024).

Limitations

This study has several limitations that should be considered when interpreting the results. First, the research design is non-experimental, which means that causality cannot be established. The findings suggest associations, but they do not prove cause-and-effect relationships.

Second, the sample size is relatively small and may not be representative of the broader population. As a result, the generalizability of the findings may be limited. Moreover, the geographic scope of the study, being confined to izmir and one specific institution (BILSEM), further narrows the representativeness of the sample. Further studies with larger, more diverse samples are needed.

Third, It is known that children identified as gifted and receiving special education tend to have higher levels of self-efficacy (Alabbasi et al., 2023; Pajares, 1996). This study includes gifted children who are continuing their special education process. Future research that includes children who do not have access to diagnosis and special education could provide interesting results.

Suggestions

It is important to conduct studies on how spending very long durations playing online games under the name of "esports" affects the skill fields of the individuals when the gifted children do not receive an education according to their features, and on the effectiveness of the counseling intervention programs related to the possible online gaming disorder.

Very little is known about the in-game behaviors, virtual identities, and game and avatar choices of gifted children (Wood & Szymanski, 2020). Future studies in this area could provide a deeper understanding of gifted children and help better comprehend the reasons behind their gaming behavior.

In future studies, a more diverse and geographically dispersed sample could be employed, incorporating children from varying socio-economic backgrounds and different regions. This would enhance the representativeness of the findings and provide deeper insights into the experiences of gifted children across different contexts.

The gaming industry is growing every day, and at the same time, the content of gaming is diversifying. For instance, platforms like Twitch, which feature live video game streams, have high viewership statistics; however, little is known about the effects of watching video game players on the viewers themselves (GomezRomero-Borquez et al., 2024). Future studies in this area may help us better understand the underlying aspects of gaming disorder.

Declaration of Conflicting Interests

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